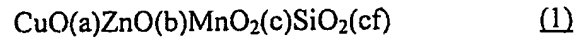


APPLICANT(S): LEE, Jung-Ho et al.,
 SERIAL NO.: Not Yet Known
 FILED: Herewith
 Page 2

AMENDMENTS TO THE CLAIMS

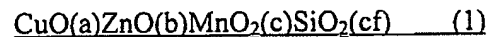
1. (Currently Amended) A hydrogenation catalyst represented by ~~the following~~ formula 1:

~~Formula 1~~



wherein a, b, c, and d are represented on the basis of weight, wherein a is 20 to 90, b is 0.01 to 10, c is 0.01 to 5, and d is 5 to 50.

2. (Currently Amended) A method for the preparation of a hydrogenation catalyst represented by formula 1:



wherein a, b, c, and d are represented on the basis of weight, wherein a is 20 to 90, b is 0.01 to 10, c is 0.01 to 5, and d is 5 to 50 according to Claim 1, the method comprising the steps of:

- (1) coprecipitating copper, zinc, and manganese components into the form of hydrogel by preparing a mixed aqueous solution of copper salt, zinc salt, and manganese salt and then applying an aqueous alkali solution thereto;
- (2) adding a nanosized silica to the thus produced coprecipitate;
- (3) hydrothermally aging the slurry mixture; and selectively,
- (4) filtering the aged slurry solution to isolate a precipitate and rinsing it; and
- (5) drying and forming the rinsed precipitate.

3. (Original) The method of claim 2 characterized in that the temperature of the slurry solution of (1) is in the range of 1 to 30 °C and its pH is maintained in the range of 6 to 9.

4. (Original) The method of claim 2 characterized in that the nanosized silica of (2) is a colloidal silica and the colloidal silica is stabilized with ammonium ions (NH₄⁺) or sodium

APPLICANT(S): LEE, Jung-Ho et al.,
SERIAL NO.: Not Yet Known
FILED: Herewith
Page 3

ions (Na+), or other alkali metals, and it has a particle size of 4-60 nm, a surface area of 100—600 m²/g, and a concentration within 1 to 60 % by weight on the basis of the silica.

5. (Original) The method of claim 2 characterized in that the aging process of (3) is carried out at 50 to 100 °C for 0.5 hours or longer.

6. (Original) The method of claim 2 characterized in that in the rinsing of (4), the remaining amount of alkali metals is regulated in an amount of 1000 ppm or less.

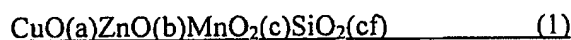
7. (Original) The method of claim 2 characterized by further comprising a process of calcining the formed catalyst at 200 to 900°C for 2 to 10 hours.

8. (Original) The method of claim 2 characterized in that in step (5), the dried parental powder is impregnated onto a carrier having a porosity of not less than 40% and a specific surface area of not more than 1 m²/g, in an amount of 5 to 40% by weight.

9. (Original) The method of claim 2 characterized in that in step (5), the precipitated cake is obtained and then directly formed by extrusion such that its hydration ratio is within a range of 45 to 50%.

10. (Original) The method of claim 2 characterized in that in step (5), the powder, which is obtained after spray drying, is formed by tableting it.

11. (Currently amended) A method for preparing gamma-butyrolactone by hydrogenating maleic anhydride in the presence of a ~~[[the]]~~ catalyst represented by formula 1 ~~according to claim 1:~~



wherein a, b, c, and d are represented on the basis of weight, wherein a is 20 to 90, b is 0.01 to 10, c is 0.01 to 5, and d is 5 to 50.

APPLICANT(S): LEE, Jung-Ho et al.,
SERIAL NO.: Not Yet Known
FILED: Herewith
Page 4

12. (Original) The method of claim 11 characterized in that the catalyst in an impregnated form is fed to the inlet portion of a reactor in a range of 1/10 to 1/2 of the total catalyst layer.

13. (Original) The method of claim 11 characterized in that before the hydrogenation, the catalyst is activated with hydrogen or a hydrogen-containing gas at 150 to 450 °C for 1 to 20 hours.

14. (Original) The method of claim 11 characterized in that the hydrogenation is carried out under the conditions of a reaction pressure of 1 to 20 atmospheres, a reaction temperature of 200 to 400 °C, and a molar ratio of hydrogen with regard to maleic anhydride of 20:1 to 100:1.

15. (Original) The method of claim 11 characterized in that the maleic anhydride is supplied in the evaporated form of a molten maleic anhydride or a gamma-butyrolactone solution containing 20 to 70 wt.% of maleic anhydride.